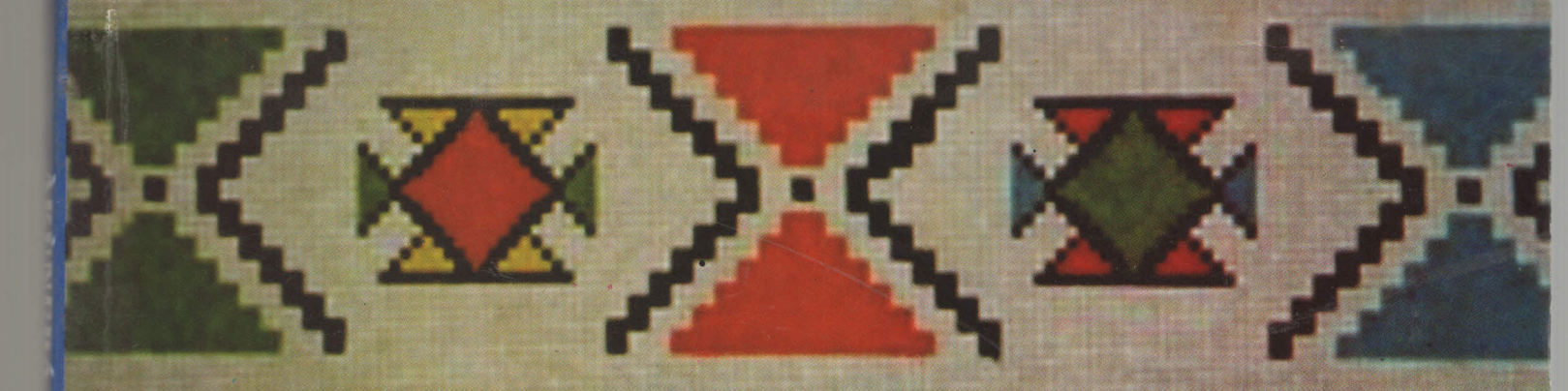




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TONAL PRESPECIFICATION IN BOKOBARU

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Abstract

Following Goldsmith's (1976) dissertation which amplifies the idea that features above segments (suprasegmentals) in natural languages are autonomous, phonologists have considered investigating the relationship between segmental and suprasegmental features essential in phonological analysis. The synchronization of segmental and suprasegmental tiers has led to the unraveling of various phonological phenomena like tonal underspecification and prespecification. This work examines tonal prespecification in Bòkóbàrù language. Hence, Goldsmith's autosegmental phonology is adopted based on its problem solving efficiency towards abstract features. The data used for this study were obtained via the use of the Ibadan 400 wordlist of basic items. A significant finding of this research is the discovery of the prespecified low toned nominaliser in Bòkóbàrù whose tone spreads regressively to its preceding syllable. This discovery adds to the existing empirical evidences on the debate of directionality in autosegmental phonology. The study concludes by recommending the application of autosegmental framework on phenomena outside phonology like reduplication where its efficiency has equally been proved.

Keywords: Autosegmental Phonology, Prespecification, Tones, Bòkóbàrù Language

1.0 Introduction

African languages have contributed to various phonological theories, but their contributions were more significant to the development of autosegmental phonology because of their unique tonal behaviours. The application of autosegmental phonology (ASP) on natural languages has revealed different relationships between tonal and segmental tiers. While some syllables are toneless, some tones are floating. The various tonal patterns in languages have been shaping and reshaping the well formedness condition (WFC) which is the association convention that links different tiers together in the theory. However, there is the need to apply the theory on more natural languages, in order to affirm the various assumptions of the framework or to open a new direction for further modification of the theory. In an attempt to partially fill this vacuum, this paper examines tonal prespecification in Bòkóbàrù language via autosegmental lens to establish the behaviours of prespecified syllables in the language and their implications on well formedness conditions.

Bòkóbàrù is one of the Languages of the Borgu kingdom. Its speakers can mainly be found in Kaiama Local Government Area of Kwara State, while some can also be found in Baruten Local Government of Kwara State. Kaiama borders Kishi to the west, it lies south of Wawa and about 80km away from New Bussa in the North. It is 140km east of Nikki. Following Welmer (1971), Bòkóbàrù belongs to the Eastern segment of the Mande sub-group of Niger-Congo. According to Jones (2012), Bòkóbàrù has an approximate of sixty-two thousand (62,000) speakers. Bòkóbàrù refers to both the language and the speakers.

2. Theoretical Framework

Autosegmental phonology (ASP) is the framework employed in this research work. ASP is a framework proposed by John Goldsmith in 1976. It is a radical departure from the ideas about the representation of basic phonological unit presented in generative phonology. In linguistics like in other sciences, new theories come on board based on the inadequacies of the former theory or theories. The linear approach of generative phonology is insufficient in its account for features that surpass segments like tones. In Yoruba, two segmentally identical words but different only in their pitch realizations and meaning two different things can be identified as in (1).

- (1) Sá "to dry"
Sà "to pick"

The segmental approach of standard generative phonology will represent consonants and vowel segments in terms of a single matrix of binary distinctive features. The words in (1) will be represented by Generative Phonology as in (2).

(2)

	s	á
Syll.	-	+
Cons.	+	-
Son.	-	+
Ant.	+	-
Cor.	+	-
H		+
L		-

s	à
-	+
+	-
-	+
+	-
+	-
-	-
	+

This representation shows tone as an inseparable feature on segments. The inadequacy of this approach was observed when applied on **contour tones** like [â] and [ã] which has both high and low tones.

low tone features. Hence, the response was to add feature [+RISING] and [+FALLING] to segmental matrices as represented in (3).

(3)	[â]	[ǎ]
	$\left(\begin{array}{c} \text{-cons} \\ \text{+back} \\ \text{-round} \\ \text{+low} \\ \text{+FALLING} \end{array} \right)$	$\left(\begin{array}{c} \text{-cons} \\ \text{+back} \\ \text{-round} \\ \text{+low} \\ \text{+RISING} \end{array} \right)$

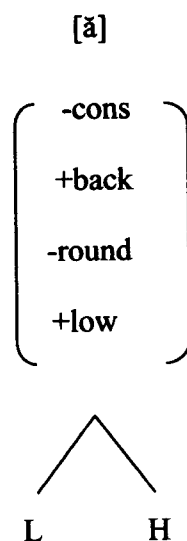
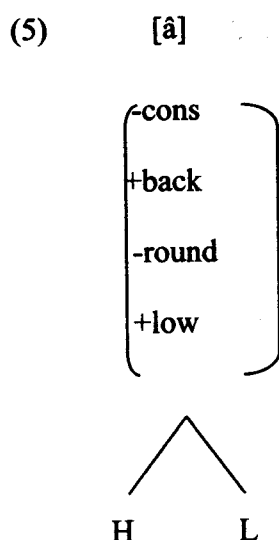
This will seem to have solved the problem until we begin to consider the behaviour of tones in natural languages.

Below are noun forms from Mende (Leben, 1978).

(4)	Base noun		+hu 'in'	+ma 'on'
a. /H/	kɔ	'war'	kɔ-hú	kɔ-má
b. /L/	bɛ̀lɛ̀	'trouser'	bɛ̀lɛ̀-hù	bɛ̀lɛ̀-mà
c. /HL/	mbû	'owl'	mbú-hù	mbú-mà
d. /LH/	mbǎ	'rice'	mbà-hú	mbà-má
e. /LHL/	nyàhâ	'woman'	nyàhá-hù	nyàhá-mà

In the above data, the enclitics -hu and -ma take their tone according to the tone of the preceding noun. When the noun ends in a falling tone as in example (c,e) or in rising tone as in (d), the two parts of the contour split: the first part goes to the last syllable of the noun, while the second goes to the enclitic. This clearly shows that when there is an extra available syllable, a falling tone maps as H-L sequence and a rising tone maps as a L-H sequence. Thus, it provides the evidence that contours should not be characterized by feature like [FALLING] and [RISING] but rather as sequence of level tone features.

Tones are autonomous from the tone-bearing unit on which they are realized. A process might affect the tone without affecting the segments and vice versa. Goldsmith (1976) proposed a representation which can be considered as the fundamental insight of autosegmental tonology as in (5).



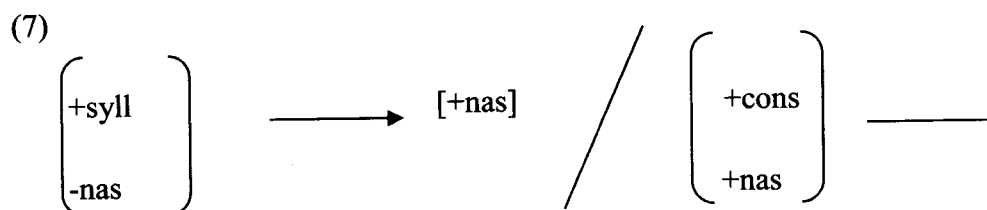
This representation places tone on another tier different from the tier that houses the features of the segment.

Goldsmith (1976, p.5) asserts that "...ever since there have been segments in phonology, there have been phenomena that evaded segmental classification, and so there have been suprasegmentals". Nasalization is another abstract phenomenon which also displays the lapses of linear approach. Below are data from Eket language where a vowel is nasalized when it is preceded by a nasal consonant

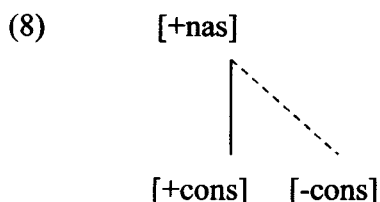
(6) Eket (Rafiu, 2004)

mì	→	mĩ 'swallow'
únà	→	unã 'meat'
úkúmúḍo	→	ukumũḍo 'cassava'

Linear model will capture this process with the rule below:



Autosegmental phonology will express [mĩ] as in (8)



This representation means that there are not two [+nas] features which associate themselves with two adjacent segments, but rather the same single feature applies to both segments. The next section introduces how the autonomous tiers synchronize.

Oyebade (2001) also observed that when elision affects a nasal vowel, sometimes its nasality relinks with the surviving vowel as in (9).

- (9)
- | | | | | |
|----|-------|-------|---|-------------|
| a. | pĩ | epo | → | pẽnpo |
| | share | oil | | “share oil” |
| b. | rã | ewu | → | rẽwù |
| | sew | cloth | | “sew cloth” |
| c. | dĩ | eja | → | dēja |
| | fry | fish | | “fry fish” |

This further justifies nasality as an abstract phonological feature

3. Association Conventions

Autosegmental phonology assumes that the features that represent each sound in an utterance are situated on different autonomous tiers. These autonomous tiers are associated together via **well formedness condition** (WFC). Hence, WFC prescribes the principles used to synchronize the independent tiers to produce speech.

Goldsmith (1976, p. 48) proposes the initial statements as below:

- (1) All vowels are associated with at least one tone;
All tones are associated with at least one vowel.

- (2) Association lines do not cross.

It has been stated that the earlier model of autosegmental phonology concentrated on relationship between tones and other features. When ASP application becomes extended to other suprasegmental features the conditions were restated as:

- a. All autosegment bearing units are associated with at least one autosegment
- b. All autosegments are associated with at least one autosegment bearing unit
- c. Association lines do not cross

Two allegations were leveled against Goldsmith's WFC: the first was the universal status these conditions assumed for contour tones, but some languages do not attest contour tones. Secondly, the conditions failed to specify the direction of spread.

To modify the observed lapses in the earlier association convention, phonologists working within this framework agreed that association convention can be stated thus:

- (a) **MAPPING**: Associate vowels with tones in a one to one fashion from left to right until we run out of tones or vowels.
- (b) **DUMPING**: If after applying [mapping] some tones are still free, link them to the last vowel to the right.
- (c) **SPREADING**: If after applying [mapping] some vowels are still free, link them to the last tone on the right.
- (d) Association lines are not allowed to cross

Durand (1990, p. 249).

The lines that link segments on the tonal tier to the segments on the segmental tier are called association lines. Association lines indicate a synchrony between the autonomous levels of representation in ASP.

We can identify three possible mapping relations which include:

One-to-one mapping which implies each tone is mapped to a single vowel.

L	H	
I	l	u

‘town’

Many-to-one mapping occurs when a single syllable is produced during the period of two distinct tones.

	HL	
	/	
	Na	

‘that’

Multiple linking occurs when syllables are produced during the period of a single tone.



3.1. Directionality

Directionality of linking is one of the issues in non linear phonology. Phonologists viewing this issue from a universal perspective have proposed that the direction of autosegmental linking is left-to-right. Recent findings have revealed that languages select their direction of linking. For example, Yoruba vowel harmony prefers right-to-left linking.

- (10) dɛ 'to hunt'
 ɔ-dɛ 'hunter'
 gé 'to dribble'
 è-gé 'dribble'

In the above data, the nominalising prefixes 'ɔ' and 'è' are determined by the vowel of the stem. Autosegmental account of this process favours right-to-left spreading as in (11)



After considering this kind of evidence, phonologists suggested that each language determines the direction of its spread either from left to right or from right to left. This suggestion is in line with the view of generativists that always permit empirical data to restructure the standing of a theoretical framework and not the other way round.

4. Tonal Underspecification and Prespecification

An underspecified syllable is a syllable whose realization depends entirely on the surrounding tones (McPherson, 2012). Syllables in this category are underlyingly toneless, but it takes tone based on its phonological context. *Tonal Prespecification* can be described as the pre-mapping assignment of tonal features to some morphemes or syllables in the lexicon. According to Clement (1981), such prespecified features are underlyingly linked with the morpheme.

The Mende data below illustrate these phenomena

(12)	Noun	"on"	indef(pl)	
	kɔ	kɔmá	kɔngà	'war
	pɛɛ	pɛɛmá	pɛɛngà	'house'
	mbû	mbúmà	mbúngà	'owl'
	ngílà	ngílàmà	ngílàngà	'dog'

The prepositional suffix "-ma" are underspecified because their tonal manifestation depends on the tone of the stem. It is realized high when it preceding syllable is high and low when it is preceded by a low toned syllable. Autosegmental will represent this process as in (13).

(13) Underlying

TONAL TIER:	H θ	H L θ
SEGMENTAL TIER:	kɔ-ma	ngila-ma

Map

TONAL TIER:	H	HL
SEGMENTAL TIER:	kɔ-ma	ngila-ma

Spread

TONAL TIER:	H	HL
SEGMENTAL TIER:	kɔ-ma	ngila- ma
	[kɔ-má]	[ngílà- mà]

The indefinite plural marker "-nga" is prespecified for low tone, therefore it has a fixed tonal manifestation. Its derivation will proceed as in (14).

(14) Underlying

TONAL TIER:	H L	H L L
SEGMENTAL TIER:	kɔ-nga	ngila-nga

Map

TONAL TIER:

H L

HL L

SEGMENTAL TIER:

kɔ-nga

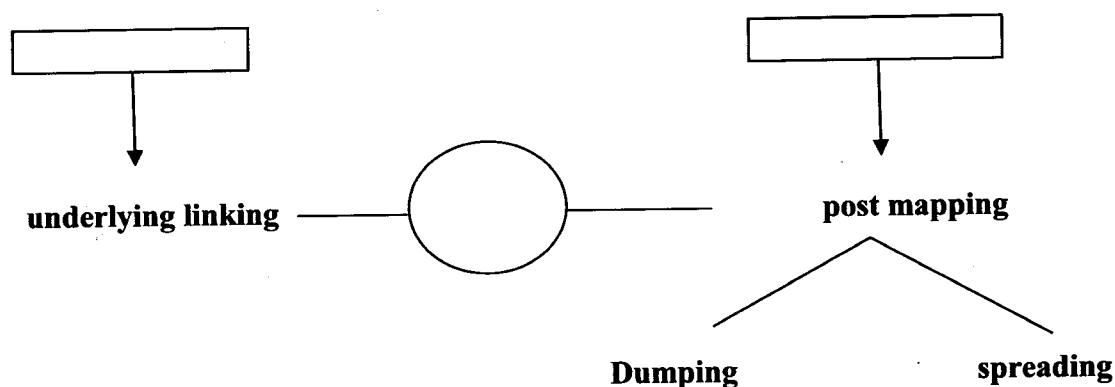
ngila-nga

[kɔ-nga]

[ngilà-nga]

Prespecified syllables are underlyingly linked before mapping while post mapping comes after applying mapping and some tones or vowels are still free. The sketch in (15) illustrates these processes.

(15)



5. Prespecified syllable in Bòkóbàrù

Bòkóbàrù exhibits a prespecified syllable as in (14) and (15) which shows the conversion of a verb or verb phrase to a noun with the use of the (nominaliser) morpheme '--rì'. This morpheme has a fixed tonal manifestation.

(16)

Nominalizer preceded by a mid tone syllable

Verb	noun
pɔble kɛ 'to prepare food'	pɔblekɛrì 'cook'
kátì zu 'vote'	kátizùrì 'voter'
áyà kɛ 'to hire'	áyàkɛrì 'tenant'
dùrún kɛ 'to commit sin'	dùrúnkɛrì 'sinner'
fààbá kɛ 'to rescue'	fààbákɛrì 'rescuer'

gbàsí kẹ 'to commit adultery'	gbàsíkẹrì 'adulterer'
ḡó kẹ 'to read'	ḡókẹrì 'literate person'
dẹ 'kill'	dẹrì 'killer'
dì 'ride'	dìrì 'rider'

(17) Nominalizer preceded by a high toned syllable

Verb	Noun
Íkpá 'swim'	íkparì 'swimmer'
lesí 'sing'	lesirì 'singer'
dadá 'learn'	dadàrì 'learner'
kàkàkí pẹ 'blow trumpet'	kàkàkípẹrì 'trumpeter'
dòkà dá 'obey law'	dòkádàrì 'law keeper'
bó 'build'	bòrì 'builder'

The data in (16 and 17) show that the low toned nominaliser which is a prespecified syllable delinks the mid and high tone respectively on its preceding syllable and spreads its feature (L spread) regressively.

Accounting for this process will definitely pose a lot of challenges for any theoretical framework that views an utterance as a bundle of unordered features. The next section shows autosegmental analysis of the data.

6. Autosegmental Approach

The tonal melody on the verbs can be represented, non-linearly as below:

(18)a.

HM	HLM	H	LH
poble kẹ	kati zu	ikpa	lesi

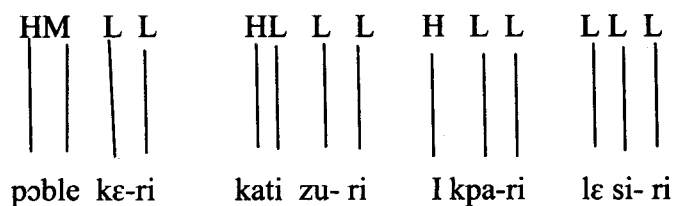
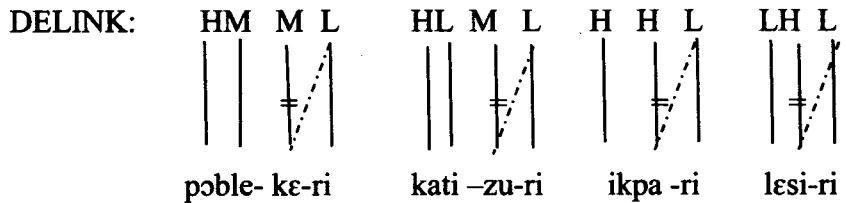
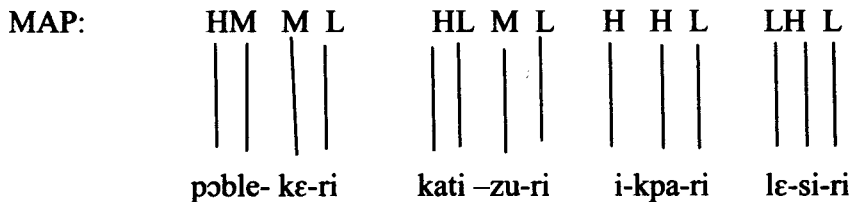
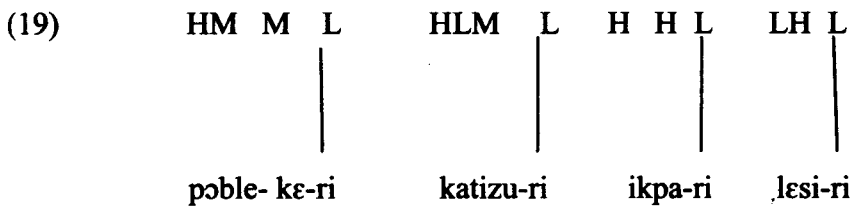
b. MAP:

HM	HLM	H	LH
poble- kẹ	katizu	ikpa	lesi

c. SPREAD:



In the noun forms, the suffix has a fixed tonal manifestation and it delinks its preceding syllable. Hence, we assume that the '—ri' nominaliser in Bòkóbàrù is prespecified for autosegmental feature (tone). Therefore, the derivation will proceed as in (17).



[poblekɛri] [kátizùri] [íkpaɾi] [lɛsiri]

We can also postulate that the alveolar approximant [r] enhance the spread of the tone of its syllable to the preceding syllable while all other consonants in the language block it. In zongbeyan dialect of the language /r/ does not exist. Therefore words that have /r/ are realized without /r/ as shown in the examples in (18):

- (20) [kúru ~ kúú] 'hawk'
 [bára ~ báá] 'skin,hide'
 [nàro ~ nàò] 'count'

7. Findings

1. A prespecified low toned nominaliser whose tone spreads regressively to its preceding syllable was discovered in the language.
2. Prespecified syllables cannot be delinked but these syllables can delink a specified syllable
3. Tones in Bòkóbàrù perform only lexical function
4. The consonant [r] cannot occur at word initial position in Bòkóbàrù. With the exceptions of borrowed words from English language like:

romu [romù ~ lomù] 'Rome'

rutu [rutù ~ lutù] 'Ruth'

5. Progressive and regressive spreading of features is allowed in the language.

Suggestions for Further Research

In this work, ASP has served both as a guide to discovery and as a tool for expressing insights. We suggest the following for future researches:

1. Other researchers can apply autosegmental framework on phenomena outside phonology like reduplication where its efficiency has equally been proved.
2. Other phonological theories like optimality theory which is constraints based can also be applied on Bòkóbàrù language in order to identify the various phonological constraints in the language.
3. Busa, Boko and Bòkóbàrù are three languages which constitute the Boko/Busa language cluster; there is a need to conduct a lexicostatistic study of this cluster to be able to establish linguistic facts.
4. Autosegmental phonology should be applied on languages surrounding Bòkóbàrù in order to establish the principles of association obtainable in those languages. This can be useful to genetic classification of languages.

8. Conclusion

This work used autosegmental framework to analyse tonal prespecification in Bòkóbàrù. As obviously identified in our suggestions, we cannot assume that this work is exhaustive enough. However, it has identified a rear phenomenon in the language which by and large addresses some issues in autosegmental framework.

Following the discovery of a prespecified syllable in Bòkóbàrù that has been underlyingly linked from the right and spreads regressively in the language, I accord with the belief that well formedness condition (WFC) which is the association convention in ASP that links different tiers together can sometimes be violated by some language specific rules.

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